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Scan's regular Research columns feature is refereed by Dr Ross J. Todd, Associate Professor, School of Communication, Information and Library Studies at Rutgers University, the State University of New Jersey. Research columns continues to build a value for research as a process, strengthening the theoretical basis for the practice of teacher-librarianship. It gives particular emphasis to demonstrating how research can inform practice through the application of findings, questioning of assumptions, and identification and analysis of practical problems. This issue features the second of a two part article reflecting on the nature of collaboration between teacher-librarians and teachers to contribute to student learning.

The leading of learning and evidence based practice - Part 2



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When the Quality Teaching framework dimensions Intellectual quality, Quality learning environment, and Significance form the basis of collaborations and instructional interventions, quality learning does take place. The challenge is to provide evidence of this learning. To illustrate this, a brief overview is given here of a collaborative leading of learning research project at Gill St Bernards' School in New Jersey. A full report of this research (Todd 2005) has been

published in the proceedings of the International Association of School Librarianship conference in Hong Kong, 8-12 July 2005. The sample of this study was the Grade 9 cohort of 43 students (21 girls, 22 boys) undertaking a semester long course research project which focused on developing students' critical skills in research, reading, writing and presentation of ideas with the explicit purpose of enabling students to interrogate the diverse disciplinary content of their curriculum to build new meaning and understanding. The theme of this program was *Celebration of culture*, and students were given a free choice of topic to research. Quality teaching and learning centered on the collaboration of seven teachers and the teacher-librarian to develop complex research skills, strategic and deep information seeking, higher-order information analysis and synthesis. The central focus was the development of deep knowledge and deep understanding of topics, and to provide evidence that substantive learning had taken place.

Data was collected from multiple sources, including a free generation written protocol administered at three stages in the information search process. This sought to uncover students' base knowledge, perceptions on levels of knowledge, and their

information seeking and use experience, in order to measure changes in the knowledge construction process, and to examine how attitudes and behaviors changed from initiation to presentation. In addition, a resource use tracking journal and affective domain tracking document were used.

In relation to Intellectual quality, the protocol sought to measure students' changes in knowledge about their chosen topic in five ways:

- (1) Substance of knowledge which was based on the analysis of type of statements the students made and classified according to Properties, Manner, Reason, Outcome, Causality, Set Membership, Implication and Value judgment
- (2) Amount of knowledge measured by a count of the number of statements students used to describe their topical knowledge, as well as as the count of isolated concepts listed
- (3) Structure of knowledge where students representations of their knowledge at each stage were examined and coded in terms of their coherence and structural centrality
- (4) Perceptions of knowledge where students indicated their own estimate of their topical knowledge from nothing to a great deal

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- (5) Title of knowledge where students were asked to give a title for their inquiry project, which was considered to reflect the degree of focus or specification of topical knowledge, and an overall conceptualisation of their understanding.

The initial representations of students' knowledge of their topics were primarily lists of unrelated concepts, and statements about the topics which listed a number of properties, and language associations (such as alternative expressions or labels). Overall, statements were primarily property, manner, and generic descriptions of their topic that showed a surface level of existing knowledge. The initial representations had an average of four statements, with an overall range from 0–11 statements, indicating a low level of pre-existing knowledge of their topics. Typically, the statements were randomly recorded; unstructured, with no clear sequence or organisation. When some organisational structure was evident, this was primarily a chronological or historical sequence of facts. Students overall indicated that they knew little about their topics.

The midpoint of the project, after building background knowledge, coincided with students writing a 100 word abstract to convey the scope and structure of their reports. A very explicit component of the collaboration was the deliberate construction of a supportive classroom environment to enable students to develop deep knowledge and understanding. Instructional interventions that facilitated this included: working with appropriate sources to get background information; concept mapping and mind mapping techniques to chart the scope of topics; advanced web searching techniques; strategies for dealing with conflicting information in different sources; as well as personal interviews with class teachers and school librarian to discuss resource needs, barriers to searching, and other issues the students might be experiencing.

The midpoint analysis of the students' representations of their knowledge showed an increase in number of propositional statements, from 6 to 34 statements; (average of 17 statements). Consistent with a focus on building background knowledge, there was still a strong representation of properties, lists of facts describing characteristics, as well as manner statements describing processes, styles, actions. However, there was also a strong presence of reason statements; the provision of explanations of how and why, in relation to factual statements. These explanations tended to be elaborative and inclusive rather than descriptive, that is, the students did not just add list of facts, but made explanatory connections that expanded and integrated isolated facts listed in their initial representations. Unlike the initial representations, the midpoint representations showed some evidence of organisational structure of ideas. There was some attempt to develop conceptual groupings of facts, rather than randomly listing them.

However, the themes were not often linked into any clear overall coherent and integrated structure.

Following the completion of the abstract, and consistent with Kuhlthau's stages of the Information Search Process (2004), students engaged in collecting information specific to their focus, and constructing their papers. This collection stage was supported by a number of instructional interventions which focused explicitly on the analysis and synthesis of information. This included the compilation of a series of note cards in the students' own words, each recording central ideas with supporting ideas based on the selection of

information that the students considered highly pertinent to their topic; the sequencing and grouping of the note cards to assemble ideas into interrelated themes and to build an overall integrated and coherent structure. The initial arrangement of these cards formed the outline of the paper and the first draft. A week after the completion and submission of the paper, students were given the third writing task, asking them to write down again what they knew about their topic. As with previous writing protocols this was done from memory, with no reference to the note cards or working manuscripts.

The analysis of the knowledge representations at the end of the project showed that the average number of statements was 31, with a range from 8 to 63. This is considerably more than the initial representations. At this stage, there was no evidence of listing of isolated concepts. The representations showed clearer and more precise listing of properties and manner state-

ments, as well as increased use of statements that presented reasons, outcomes, causality, implications, predictive, and reflective; all indicative of increased complexity and specificity of topics. Four students showed a decrease in number of statements when

compared to the second representation, and on analysis, these reflected higher levels of synthesis, that is, the students coalesced increasingly long lists of properties and manners into conceptual categories, and simply presented a more conceptual statement. The final representations also showed higher levels of structural centrality and conceptual coherence to form an integrated whole, that is, an overall integrated and interlinked structure,

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yet subgroups of ideas that were clearly sequenced and interlinked, with attention given to explanations and followed through with implications.

The representations of students' knowledge at the different stages suggest that the collaborative program of instruction contributed to the growth of intellectual quality. The development of knowledge representations from simplistic, superficial and disjointed structures to structures that embedded explanations, causal, predictive and reflective statements reflected this change. Particularly noticeable was the analysis and organisation of ideas into structured conceptual groupings, which conveyed a sense of knowledge coherence and depth. Knowledge depth was further conveyed in the use of specific terminology associated with the celebrations, and the explanatory details surrounding these. There was substantive evidence that students were using the language specific to the topic domain, not just providing the terms, but clarity of providing descriptions and explanations surrounding these terms.

As students progressed, there was some change in the nature of the sources used, particularly to print and electronic sources that dealt solely with the particular celebration as a basis for building deeper knowledge.

Given that the knowledge representations in this study were constructed from memory, the students progressed in developing deep understanding of their topics, and this was further evidenced in the choice of resources students used throughout their projects. These choices were recorded

in process journals and resource logs kept by students, and these showed increasing complexity and depth. The students' search logs showed that background knowledge was typically built through using encyclopedia references to the particular celebration, or descriptions of the celebration in country-specific books, or information gathered from country, travel or festival web sites. There was also some use made of compendiums which listed and briefly described numerous festivals and celebrations around the world. As students progressed, there was some change in the nature of the sources used, particularly to print and electronic sources that dealt solely with the particular celebration as a basis for building deeper knowledge.

In terms of the Intellectual quality element of substantive communication, the overall fluency and fluidity of the written representations indicate ability to substantially communicate in writing about their topical knowledge. Students also engaged in a number of interviews with their classroom teacher and teacher-librarian during their research. Their written comments showed that they valued the opportunity to talk about their projects, in terms of substantive content and the research process. They saw that these conversations helped clarify the direction and scope of their research, and to determine what were the most pertinent ideas for their topics. There was also some evidence that students had engaged with knowledge as problematic so they could deal with conflicting facts or viewpoints and showed evidence of constructing arguments and explanations around conflicting viewpoints.

Students' responses to the open questions about barriers and enablers to their learning, shed light on aspects of the learning process and learning environment they valued. In particular, students clearly valued the supportive environment: opportunities for dialogue, feedback, encouragement and dealing with the emotional and

intellectual demands of the task. The supportive environment was evident in other ways: instructional interventions explicitly targeted to the skills requirements of the project, for example, the class activities that helped them impose structure on their ideas and transform them into personal understanding. Students also valued the instructional intervention that modelled the intellectual scaffolds for successfully building and demonstrating their new knowledge and understandings of the topic. The students did not feel abandoned during the research process, particularly at the writing stage, when complex thinking and writing processes were required, and they valued the creative activities which enabled them to be successful.

Students also valued that the whole process was presented to them with stages and milestones to be reached. They were provided with guidelines which encompassed the whole learning process, clear expectations of tasks to be submitted, criteria for assessment, dates, and feedback and support mechanisms. This provided direction and regulation for the students which appeared to keep them on task and engaged, and able to manage the daunting task complexities.

Two aspects of relevance, particularly links to students' background knowledge and connection to the world beyond the classroom, came through in the study. When students were asked to identify how much they knew of the topic, there was a definite and clear progression from very little to a great deal, with links made to low levels of initial knowledge. Four categories emerged in the changes to the amount of knowledge:

- (1) the students stated that they knew *heaps* more
- (2) they knew more, and expressed surprise at the breadth and depth of their current knowledge
- (3) they knew a lot more, but felt they still could learn more

- (4) they knew lots, but mentioned some dissatisfaction about not knowing enough.

When asked at the initiation of the research why they had chosen their particular topic, they cited personal experiences (participating in a particular celebration), personal connections (know someone who participates), knowledge of intriguing facts or aspects about topic, or curiosity (typically based on having read or viewed something), as the primary reasons for selecting their particular topic. These reasons primarily reflect connections made to personal real life contexts, and these findings underscore the importance of embedding learning in meaningful life contexts. However, as students learned more about their topic, the specific new knowledge they acquired generated curiosity and motivation, encouraging them to dig deeper into their topic. In addition, when asked what they had learned in this project, the students identified increase in content knowledge, and the acquisition of a range of useful skills that would help them further with their schooling.

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Conclusion

School librarianship is a profession of possibilities, not trying to do more with less. When a commitment to

quality learning and building knowledge outcomes through quality teaching are given precedence, the leading of learning is enabled, and quality outcomes are generated. Underpinning this is carefully structuring the learning environment in ways that enable students to be intellectually productive, and understanding the enablers and barriers to high

quality learning. This calls for careful thinking and reflecting on the nature of collaborations, building them around carefully identified learning needs, and implementing strategies to chart the learning outcomes. As teacher-librarians participate in this agenda of school reform, school libraries will be viewed as integral rather than marginal to schools. ■

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